DOCUMENT RESUME

ED 281 752 SE 047 946

AUTHOR	Fausto-Sterling, Anne; English, Lydia L.
TITLE	Women and Minorities in Science: An Interdisciplinary Course. Working Paper No. 154.
INSTITUTION	Wellesley Coll., Mass. Center for Research on Women.
SPONS AGENCY	Fund for the Improvement of Postsecondary Education (DHEW), Washington, D.C.
PUB DATE	85
NOTE	48p.
AVAILABLE FROM	Wellesley College, Center for Research on Women, Wellesley, MA 02181 ($4.00).
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Black Studies; *College Science; *Course Descriptions; *Females; Higher Education; Integrated Curriculum; *Minority Groups; Reference Materials; Science and Society; Science Education; Science Instruction; Scientists; *Womens Studies

ABSTRACT

"Women and Minorities in Science" was developed as a course that would bridge the gap between traditional women's studies and Afro-American studies courses. This paper provides a descriptive account of how the course was developed and discusses its content and instructional approach. The class schedule is provided and includes a listing of the topics covered, the format employed, and the readings required. Resource materials and sources are identified and listed in the categories of: (1) bibliographies; (2) books (separate sections for Black Studies and Women's Studies); (3) science as a social process; (4) women and minorities in science; (5) other minorities; (6) journal articles; (7) visual aids; (8) journals; and (9) reference works. (ML)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED281752

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

WOMEN AND MINORITIES IN SCIENCE:
AN INTERDISCIPLINARY COURSE

ANNE FAUSTO-STERLING

and

LYDIA L. ENGLISH

1985

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Anne Fausto-Sterling
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Funding fo the development of the course described in this paper came fom the Fund for the Improvement of Postsecondary Education as part of a grant to develop collaborative learning projects. The grant was made to the office of the Dean of the College at Brown University.

Working Paper
NO. 154

Wellesley College
Center for Research on Women
Wellesley, MA 02181

SE047946

WOMEN AND MINORITIES IN SCIENCE: An Interdisciplinary Course

by Anne Fausto-Sterling and Lydia L. English

----- The media portrayed scientists as "neurotic little men with strange names, German accents and fancy scientific jargon. They were never Black and they were never from the projects".

----- "When I graduated from high school a friend predicted that I would someday be a woman scientist in a white lab coat with my hair in a bun.."

----- "I was unable to see myself as the mad scientist ... spending all my waking hours in a laboratory, engrossed in test tubes, chemicals and scientific periodicals".

----- "The word 'scientist' always conjured up images of a white older male with eyeglasses".

----- "What does a scientist look like? ... A tall skinny man with a white lab coat, glasses and greasy brown hair".

The collective description of the scientist as a man of European ancestry engrossed in his work, funny-looking and slightly mad (or a severe female Blue-stocking) emerges from the writings of students attending a course on

Women and Minorities in Science taught to undergraduates at Brown University during the Spring of 1985. For some years I (AFS) have been aware of high student attendance at any lecture on women in science. Yet despite such obvious interest I resisted teaching a course on the topic because I felt that the material available was fragmentary, and I couldn't see how to avoid a "great women in..." format, which I felt would in the long run provide little intellectual challenge or opportunity for political analysis. The publication of two books — Rossiter's Women Scientists in America[1] and Manning's Black Apollo of Science[2] -- in addition to the continued appearance of new and more analytical articles on the topic led me to reconsider.

Because I wanted to do something practical to bridge the gap between Women's Studies — which all too often means white women's studies -- and Afro-American studies, I decided to design a course that would explicitly include both. With the aid of a small grant from money available to the Dean of the College's office at Brown (obtained from a Federal Grant to encourage the development of student/faculty collaboration in course development), I hired a minority student to work with me during a summer to develop course materials and design a syllabus. The student (Lydia L. English), a senior in our Resumed Education Program for older students, was an anthropology major. We worked throughout one summer putting together course material, and then taught the course jointly as faculty member and teaching assistant. The course had eleven students: three black men, one Asian-American woman, two white women, and five black women. Most of the students were seniors and most science majors from fields such as biology, engineering, computer science and biochemistry.

The small class size permitted a seminar format. To make the setting more intimate and informal we arranged the seating in a circular style,

allowing both teachers and students to sit face to face. Although there was a rare lecture, for most of the classes participants took turns summarizing the assigned readings and setting up points for discussion. Each student was required to present three specific readings on the syllabus and we (LLE/AFS) took the overload. The class usually consisted of three to four presentations with the students required to turn in a short (1-2 page) written account of their discussion. These were read and handed back with an often equally-long set of comments and suggestions on both the oral presentation and the form and content of the written summary. We encouraged students to move beyond a recounting of "the facts", trying to get them to talk about their emotional reactions to what they read. We also helped them to read critically, pushing them, for example, when they dutifully reported on an over-romanticized biography to ask whether they <u>really</u> bought what they had just read.

Our students had the most difficulty believing (a) that we really wanted to hear what they thought about the readings and (b) that it was intellectually permissible for a "mere student" to express emotional reactions to "official" classroom reading. As they grew to trust that we really wished to hear from them however, the classroom lit up. We never had enough time and often everyone in the room -- shy and outgoing alike -- spoke at least once in a 90 minute period. As the course progressed the students became quite skilled at perceptive analysis and catching the essence of the readings. The students highlighted tensions which opened them to thinking deeply about issues such as the need for mentors versus the experience of isolation, interaction with the white male world, institutional versus personal relationships, commitment to self and community.

Through class discussion we all developed a sense of trust and intimacy and the confidence to be open about our feelings, beliefs, apprehensions and

ignorances. As we shared our varied experiences we dispelled many myths, stereotypes and assumptions that all of us held in some form or another. We learned that there were commonalities within the group, but we discovered that all black students, all white female students and all Asian students could not be lumped into closed categories.

The students also developed a group solidarity which heightened their consciousnesses to the concerns facing black males, females and other ethnic groups. One student told the class that this was the only course he had had at Brown where he felt free of competition; the open communications allowed him to freely express himself. It is probably not an accident -- and at any rate added to the classroom interactions -- that most of the students became deeply involved in campus struggles (including a sit-in) around the needs to hire more minority faculty and alter the curriculum to make it it less Eurocentric and male-dominated. The class activities benefitted from the tensions of political activity even though students were often exhausted from all-night meetings.

There were no exams in Women and Minorities in Science. Rather at mid-semester each student wrote a self-reflective essay on his or her relationship to science drawing on personal experience, as well as issues raised in class and the literature. The topic was open-ended and individual students chose to deal with it in different ways. Originally the students were to do individual research projects for the final assignment, but we found their self-reflective essays so poignant and powerful that we suggested to the class that they do a collaborative final project incorporating the essays into a booklet. The students exchanged essays with each other, wrote constructive critiques, and then returned the essay to the author. The essays were then rewritten using the student critiques as well as the one written by the

instructor (AFS) for the original assignment and printed with no further editing from the instructors.

The class accomplished diverse objectives. For us (AFS/LLE) the class was always interesting, provocative and fun. We got to know who the students really were and share with them some insights into our experience; we also grew from listening to theirs. The students honed their analytical skills while developing their speaking abilities and listening capacities. As they learned the history of women and minority scientists they were able to relate the experiences of those historical personages to parallel issues in their lives today.

Syllabus and Resource Guide

As part of the preparation for the course we put together a guide which lists most of the available resources on women and minorities in science,[4] as well as suggestions for background reading, a list of visual aids, and a list of relevant reference works and journals. Although we did not expect specific work from students based on material in this guide, we wanted them to be aware of the breadth and variety of materials available.

The syllabus[4] was divided into three parts. We started out by asking general questions about science. Who is a scientist? Who defines science? From where does science derive its prestige? In considering these issues we read an article by L. Laudan entitled "The demise of the demarcation problem" and a selection from Ehrenreich and English's For Her Own Good.[5] The issues raised in this first class stayed with us throughout the semester. We agreed NOT to define science and to keep an open mind about who we defined as scientists. Students wondered all semester long why black holes, quarks and tachyons deserved research money, prestige and legitimacy while other more

"down to earth" kinds of activity — including non-European approaches to holistic healing, traditional Chinese science, and Native-American belief systems often acquired the label of "superstition". A continuing tension in the course existed between a desire on all of our parts to affirm positive aspects of "objective" western science, while at the same time looking hard at its deep prejudices and lack of objectivity.

The first third of the course we devoted to short biographies of black and/or female scientists. Starting in the 18th century with Benjamin Banneker and using Wilson's "Dancing Dogs of the Colonial Period: Women Scientists"[6], we took three weeks to look at 19th century physicians and scientists, and early 20th century biologists, physical scientists and mathematicians. We made an effort to find good examples of black men and women and white women in a variety of fields and periods looking for biographical accounts as well as letters and diaries. The material was weakest for black women, who have been systematically ignored even in the most up-to-date literature. In fact, statistics on black female PhD's were not compiled until 1974. As can be seen from the full syllabus, however, some material is available.

Particularly useful were some examples which compared blacks and whites, as was the case with the admission of three black men and one white woman to Harvard medical school in the 1850s. All were forced to withdraw after the protest of their classmates, but the circumstances differed for each group. A section of Ron Takaki's book Iron Cages and an article by Philip Cash in the Harvard Medical School Alumni Association Bulletin were especially helpful.[7]

Within the first week of class the students had brought out a variety of similarities and differences between white women and black men and women who struggled to do science in the 18th and 19th centuries. All experienced intellectual isolation, lack of educational opportunities, treatment by the

white male world as anomalies (J.H. Wilson's "Dancing Dogs"), the need for white male mediation in order to gain access to and recognition from the scientific establishment and a Hidden History -- the lack of widespread acknowledgement of their accomplishments. The theme of "a room of one's own" loomed large in the biographies we read. We learned that Benjamin Banneker in the 18th century sold his valuable farm in order to get an annuity so that he could devote himself to astronomy, while Libby Hyman in the 20th, supported herself with sales from a laboratory manual in order to obtain free space to write her monumental works on invertebrates. The struggle for space, time and money to be practicing scientists was shared by almost every individual about whom we read.

There were, however, striking differences among those we studied. In the 18th and 19th century the white women who became scientists were daughters of the middle class. They sometimes had a small independent income or the opportunity to teach at a women's college or seminary. Even Blacks with middle class professions, however, had a bitter struggle just to feed themselves. More of the black figures about whom we read -- men such as Martin Delaney, women such as Halle Dillon or Susan Smith McKinney[8] -- were politically motivated to improve the health care of poor Blacks, as abolitionists and/or as emigrationists. White women tended to have a lower social consciousness and more esoteric interests in science. (Of course absolute generalizations are risky, but these were themes that students picked up on.)

We finished the section on short biographies by reading Vivian Gorvick's Women in Science.[9] Although the book is flawed because it never mentions race, and because -- in our opinion -- it presents a sloppily over-romanticized view of science, our students reacted very positively to its lively portraits. Gornick succeeds in bringing to life a variety of different women scientists

showing us their views of science, the difficulties they faced and the pleasure they gained from doing research.

By the end of this section of short biographies the students had accomplished several things. They had become familiar with some names and dates and learned a little about how science was done in the 19th century. They had studied a bit about the professionalization of science and learned of its effects on black and on female scientists. They had performed an almost ritual naming of names. One student gave a long report on an article which briefly listed a number of black scientists and found herself unable to summarize it. In the middle of her recitation she apologized, saying that she couldn't bear to leave anyone out, that the names had gone neglected for so long that she felt it important to say them all out loud.

By one third of the way through the semester the students had also raised a variety of points of interest to their own lives and futures. How for example, did the relationships between black men and women differ from those between white men and women? That Black women worked was an accepted fact of life for our students. Black men and women also had to unite around basic issues of survival in a hostile society. In general the students expressed concern and developed hypotheses about what happened to the personal relationships, family, and children of those who sought to become pioneers by entering science or medicine.

They also talked at length about the role pioneers should play when they break into new areas. They discussed how to combine a sense of social responsibility that comes with position with something they called the Spotlight Effect -- how to deal with being in the spotlight at all times (as the only... or the first...) without becoming paralyzed. The minority students experienced the problem in classes at Brown. Many of them felt a need to be

perfect, never to make a mistake, to "represent the race" (or "the sex") outstandingly. It is a very heavy burden for any one individual to bear.

Another continuing question was one of social responsibility to the outside community. For some students figures such as Helen Caldicott were important symbols; she could obtain public notice because she had "the right credentials" but used her status as a physician to speak out about nuclear war and disarmament. From the black students — especially those who will become doctors — came a great deal of discussion about responsibility to the black community. Should they practice in the black community? Should they go to the prestigious "white" hospitals for training? Should they become medical researchers even though that meant they would most likely have to work in predominantly white settings, ones in which they could not easily set the agenda to favor the needs of poor and working black people? The conflict between personal development — using the opportunities of well-funded, well-staffed and beautifully equipped research and training centers — and the needs of poor communities was central to these students. They looked to the historical figures we studied to gain some guidance in their personal choices; the history applied directly to their own lives and they seized the chance to use it, talk about it and think about it.

We used outside speakers to help us make the transition to the middle section of the course which focused more deeply on institutional issues. A black woman with a master's in physics compared her experiences as an undergraduate in a southern black woman's college with those in her northern prestigious, predominantly white graduate school. We followed this class with a discussion by two historians, one offering background on the development of higher education for white women (especially the women's colleges) and the other on the history and role of all-black undergraduate colleges. In

preparation we read a chapter from Women's Realities, Women's Choices, two thought-provoking articles by W.E.B. du Bois from The Education of Black People, an article about Booker T. Washington, and an article from Sage on "Black Women's Higher Education".[10] The combination of trained historians and interesting readings (as one student put it: "that article on women's education was really awesome") made for an exciting class and left the students with a long list of things to think about.

At the time of the transition to the middle section of the course the class had managed to "name some names", understand a little bit about the scientific and personal lives of some important scientists, seen more of the sketchiness and inadequacy of the available material -- especially material on black women scientists -- and obtained brief glimpses into institutional and historical issues such as slavery, African resettlement, Jim Crow, the Cult of True Womanhood and the impact of professionalization on Blacks and women. We were, therefore, ready to do more in depth work on institutions. We used as our texts two books, Ken Manning's Black Apollo of Science: a biography of Ernest Everett Just, and Margaret Rossiter's Women Scientists in America, Struggles and Strategies to 1940. Both are chock full of information about the scientific establishment, struggles to gain grants and support, internicine battles at black institutions such as Howard University and much more about the personal lives of scientists trying to make their way through the maze of foundations, universities, personal prejudices, and institutional discrimination. Just appears as a tragic figure and the students both identified with and were critical of him. They found his story very moving. Similar reactions emerged from reading the Rossiter book, and overall the students' understanding of the complex interplay between institutions and individuals who work in them deepened enormously.

Neither the Rossiter nor the Manning books are perfect texts. Manning treats his female subjects in a way that made us all uncomfortable. His is not the pen of a feminist. Rossiter, on the other hand, never addresses the issue of race leaving it glaringly absent from the book. Yet both books have so much information and so many strengths that they must not be ignored. The students gained enormously from studying them and discussions of the books' shortcomings became part of an extended consciousness raising process. Although they are difficult, long and not politically perfect (what is?!), we strongly recommend their use. Both books provide intellectual depth and personal insight for students studying women and minorities in science.

During the last two weeks of the course we considered the issues of women and minorities in science from a third perspective by asking how western European science might change were it to incorporate non-European perspectives such as those of native America, traditional Africa, traditional Chinese science, and the vision brought to the practice of modern science by western feminists. For this section we read articles by Rayna Green, Shirley Malcom, Joseph Needham and Evelyn Fox Keller (among others).[11] By this point in the course class members were open to hearing alternative views of science and in the future we would try to give another week to this topic. There was too much to discuss and too little time.

The semester thus ended on a futuristic note. Reading about other world views using material which could easily form the core of an entire separate course, left the students with a feeling of accomplishment as well as an awareness that there was much exciting material still to explore. The idea that the world of science presented to them in our classrooms was not the only possible way of science left them critically alert. They had learned to question even the rock of objective science.

Conclusion

Because of the mystique which surrounds the profession, the image of a scientist is one that many people find difficult to identify with. For most students a scientist is a white middle-aged male with thick eyeglasses, a European accent and a white lab coat. He is usually totally involved with his work and does not/cannot deal with the mundane aspects of life such as family, friends and fun. As we pondered this image over and over throughout the semester, we tried to get at the source of this perspective and determine how and why science as an enterprise seemed to be so remote and inaccessible.

Our discussions started with an attempt to dispel the myths about science and to explicate the issue of demarcation between science and non-science. Where do our images come from? Why is scientific knowledge sacred? What is the essence of science? Who can do science? These questions led us to one of the major issues of exclusion for black and women students -- i.e., a lack of strong role models. Most of our students had never come into contact with women or minorities working in science, though they had knowledge of a few famous historical "exceptions" such as George Washington Carver and Madame Curie. But these were anomalies, not regular folks with the desire and interest to pursue a scientific goal.

We needed historical evidence of others who had been involved and made contributions, others who had overcome racism, sexism and classism. It was crucial for us to recount accomplishments, to recite a litany of names. We had to delve into lives exploring the personal, professional and psychological dimensions of attainment and achievement. Our journey through the histories

had a profound emotional impact as we experienced the anger, frustration and struggle that our foresisters and brothers went through to pave the way.

As teachers of this course we were faced with the dual challenge of elucidating the discouragements and obstacles facing those traditionally shut out of scientific and medical careers while exposing the students to the accomplishments and achievements of pioneers [women and minorities] in science. We wanted to offer realism without killing their interest in science and their enthusiasm about their own professional futures. Our journey through the course materials led to the sharing of insights, opinions and experiences which forced us all to sharpen our analytical skills and to articulate important issues and questions confronting aspiring women and minority scientists.

The diversity of the group's frames of reference illuminated the need for a comprehensive approach to science teaching. Though there were some commonalities within this group, we discovered that perspectives based on family background, educational experience and exposure to other groups of people varied considerably. Fears of isolation, of being the only one, of being considered odd were shared, but the basis of these fears stemmed from different sources. The women, both black and white, often found themselves the only one or one among a very few in some courses particularly engineering, math, physics and computer science. Black men on the other hand felt isolated from collegial relationships and study groups. Essentially the "old boy networks" form a barrier that is very difficult to penetrate for all non-white males and females.

The students were primarily concerned with fitting into the scientific sub-culture and the social skills necessary to do so. Chief among these concerns were how to establish mentor relationships, how to discern one's own abilities and aspirations in the face of discouraging or ambivalent messages

from teachers and advisors, and balancing a scientific career with a satisfying family life. Though many students participated in high school science programs often mixed messages were received about future pursuits. In some cases students were advised not to try to compete in the best institutions. In others students were advised to confine their efforts to only the top universities. But the salient aspect of high school advising was that it was inadequate in providing students with a real sense of the possibilities open to them.

At another level family and social environments played major roles in determining future choices. Some students were the first generation of college-educated members in their families. These students had problems in relating their concerns and programs to their parents, many of whom have fears for their children's success. Other students felt pressured by their parents' aspirations for them and feared not being able to meet these expectations. In both these situations students had to figure out how to break out of social/cultural stereotypes projected onto them from the generational concerns of their parents.

What is the relationship between science and society? Is the objective study of abstracts inapplicable to everyday reality or should science be utilized to illuminate basic problems of the human condition? These are the questions raised by the class; in them there is a powerful message for educators. The students agree that science is a social process limited by human dimensions, i.e., historical, social, political and cultural. They feel that teachers must seek to integrate the pursuit of scientific knowledge with the responsibilities of social consciousness, encouraging and motivating students to get involved in important questions and issues concerning humanity.

How to incorporate the historical factors of race, gender and class while looking forward to a more progressive society is the most complex issue facing today's student. Does commitment begin with self or community? Do women and minorities owe a special obligation to the communities from which they come? Can these groups afford to be non-political? Our students must learn to balance these factors with the practical needs of earning a living and maintaining a sense of self-confidence and esteem. Courses such as Women and Minorities in Science can aid in their efforts.

Footnotes:

1. Rossiter, M., 1982. Women Scientists in America: Struggles and Strategies to 1940. Johns Hopkins University Press, Baltimore.

2. Manning, K., 1983. Black Apollo of Science: the Life of Ernest Everett Just. Oxford University Press, NY.

3. The Brown University Dean of the College's office funded printing of the booklet. Copies are available from Anne Fausto-Sterling, Box G, Brown University, Providence, RI 02912.

4. Copies of the complete syllabus and the course guide are available from Anne Fausto-Sterling.

5. Laudan, L., 1983. "The demise of the demarcation problem". in Physics, Philosophy and Psychoanalysis, (Cohen, R.S. and L. Laudan, eds.), pp. 111-127; Ehrenreich, B. and English, D., 1978. For Her Own Good. Anchor Press, NY, pp. 29-88.

6. Bedini, S.A., 1972. The Life of Benjamin Banneker. Charles Scribner & Sons, NY, Chapters 4 & 8; Wilson, J.H., 1973. "Dancing dogs of the colonial period: women scientists". Early American Literature 7:225-235.

7. Takaki, R., 1979. Iron Cages: Race and Culture in 19th Century America. University of Washington Press, Seattle, pp. 136-144; Cash, P., 1980. "Pride, prejudice and politics". Harvard Medical School Alumni Association Bulletin 54:20-25.

8. Kass, A., 1983. "Dr. Thomas Hodgkin, Dr. Martin Delaney and the Return to Africa". Medical History 27:373-393; Aptheker, B., 1982. "Quest for dignity: Black women in the professions, 1865-1900". in Women's Legacy, University of Massachusetts Press, Amherst, pp. 89-110; Sterling, D., 1984. We Are Your Sisters. Norton, NY, pp. 440-450.

9. Gornick, V., 1983. Women in Science. Simon and Schuster, NY.

10. Hunter College Women's Studies Collective, 1983. Women's Realities, Women's Choices. Oxford University Press, Cambridge, pp. 397-433; DuBois, W.E.B., 1976. The Education of Black People (Aptheker, H., ed.). University of Massachusetts Press, Amherst, pp. 83-102, 139-158; Young, A., 1976. "The educational philosophy of Booker T. Washington". Phylon 37:224-235; Bell-Scott, P., 1984. "Black women's higher education". Sage 1:8-11.

11. Green, R. "Culturally-based science: the potential for traditional people, science and folklore" (mimeographed article); Malcolm, S. "Women in science. Why?" (mimeographed article); Needham, J., 1980. "History and human values: a Chinese perspective for world science and technology". in Ideology of/in the Natural Sciences (Rose and Rose, eds.), pp. 231-258; Horton, R., 1970. "African traditional thought and western

science". in Rationality (Wilson, B.R., ed.), pp. 131-171; Keller, E.F., 1985. Reflections on Gender and Science. Yale University Press, New Haven; Fausto-Sterling, A., 1981. "Women and Science". in Women's Studies Intern. Quarterly 4:41-50; Merchant, C., 1981. "Earthcare". in Environment 23:6-15; Schweickart, P., 1983. "What if...Science and technology in feminist utopias". in Machina Ex Dea (Rothschild, J., ed.), Pergamon Press, NY, pp. 198-211.

WOMEN AND MINORITIES IN SCIENCE (Special Themes and Topics 0072, Spring 1985)

Anne Fausto-Sterling
Lydia L. English

Class schedule and required reading:

DATE	TOPIC	FORMAT	ASSIGNED READING
1/24/85	Introduction and Overview	Staff Presentation	- - -
1/29/85	What is Science?	Guest Lecture: Dr. Phil Quinn Dept. of Philosophy	(1) Laudan, L. "The Demise of the Demarcation Problem" in Cohen, R.S. and L. Laudan eds. Physics, Philosophy and Psychoanalysis pp. 111-127 (1983) (2) Ehrenreich, B. and D. English For Her Own Good pp. 29-88 (1978), NY
1/31/85	18th & 19th Century Scientists	Student Presentations and Discussion	(1) Wilson, Joan Hoff "Dancing Dogs of the Colonial Period: Women Scientists" Early American Literature (1973) 7, pp. 225-235 (2) Klein, A.E. The Hidden Contributors NY (1971) pp. 3-30 (3) Bedini, Silvio The Life of Benjamin Banneker Chapts: 4 & 8 (pp. 76-102; 202-234).
2/5/85	19th Century Physicians	Student Presentations and Discussion	(1) Aptheker, Bettina "Quest for Dignity: Black Women in the Professions, 1865-1900" in Woman's Legacy (1982) Amherst, pp. 89-110 (2) Sterling, D. We Are Your Sisters pp. 440-450 (1984) NY. (3) Kass, Amalie (1983) "Dr. Thomas Hodgkin, Dr. Martin Delaney, and the 'Return to Africa'" Medical History 27, 373-393. (4) Cash, Philip (1980) "Pride, Prejudice, and Politics" Harvard Medical School Alumni Assoc. Bulletin pp. 20-25.

DATE	TOPIC	FORMAT	ASSIGNED READING
2/5/85 (continued)			(5) Takaki, Ronald (1979) Iron Cages pp. 136-144. (6) Morantz, Regina M. (1982) "Feminism, Professionalism and Germs: the thought of Mary Putnam Jacobi and Elizabeth Blackwell" American Quarterly 34, 459-478.
2/7/85	Other 19th Century Scientists	Student Presentations	(1) Baker, Henry The Colored Inventor NY (reprinted, 1969) 15 pages. (2) Hayden, R.C. (1972) 8 Black American Inventors pp. 81-119. (Brief bios. of L. Latimer, E. McCoy, and N. Rillieux). (3) Elder, E.S. (1982) "Women in Early Geology" J. of Geological Education 30, 287-293. (4) Warner, Deborah Jean (1979) "Women Astronomers" Natural History 88, 13-26. (5) Babbitt, Mary K. (1912) "Maria Mitchell as her students knew her" pp. 5-32. (6) Mitchell, Maria extracts from her diary in Kendall, Phebe M. Maria Mitchell: Life, Letters and Journals (1896) pp. 23-38.
2/12/85	Physicians and Biologists	Student Presentations and Discussion	(1) Beardsley, E.H. "Making separate, equal: Black physicians and the problems of medical segregation in pre-world war II south". (2) Zeim, G. (1977) "Medical education since Flexner" Health PAC Bulletin #75 (3) Hayden, R.C. (1970) "Charles Henry Turner" in 7 Black American Scientists.

DATE	TOPIC	FORMAT	ASSIGNED READING
2/12/85 (continued)			(4) Haber, Louis (1970) Black Pioneers of Science and Invention pp. 123-167 (Daniel Hale Willams, Louis Tompkins Wright and Charles Richard Drew) (5) Haber, Louis (1979) Women Pioneers of Science pp. 97-104 & 117-127 (Myra A. Logan and Jane C. Wright) (6) Keenan, K. (1983) "Lilian Vaughn Morgan (1870-1952): Her Life and Work" Amer. Zoologist 23, 867-876. (7) Brush, S. (1978) "Nettie M. Stevens and the Discovery of Sex Determination by Chromosomes" Isis 69, 163-172. (8) Ogilvie, M.B. and C.J. Choquette (1981) "Nettie Maria Stevens (1981-1912): Her life and contributions to cytogenetics" Proc. Amer. Phil. Soc. 125: 292-311.
2/14/85	Physical Scientists and Mathematicians	Student Presentations and Discussion	(1) Blacks in Science (1983) I. van Sertima, ed. pp. 238-292. (2) Hacker, Sally L. (1983) "Mathematization of Engineering: Limits on Women and the Field" in Machina Ex Dea ed. J. Rothschild (3) Opfell, O.S. The Lady Laureates (1978) pp. 183-208 (Gerty Cori and Maria Goeppert-Mayer). (4) Kenschaft, P. (1982) "Black Women in Mathematics in the United States" J. of African Civilizations April pp. 63-83. (5) "Discovery of Pulsars: A Graduate Student's Story" Science (1975) 189, 358-360.

DATE	TOPIC	FORMAT	ASSIGNED READING
2/14/85	(continued)		(6) Kundsin, R. ed. Successful Women in the Sciences. Ann. NY Acad. of Sci. 208 (1973) pp. 17-28. (7) Keller, E.F. "The Anomaly of a Woman in Physics" in Working It Out (1977) eds. S. Ruddick and P. Daniel
2/21/85	Discussion of Gornick	Faculty-led Discussion	Gornick, V. Women in Science (the whole thing)
2/26/85	Black Women in Science	Guest Lecturer and Discussion Leader; Evelyn Hammonds, Digital Computer Corp.	
2/28/85	Black and Women's Institutions of Higher Education	Guest Panelists: Mary Jo Buhle and John Dittmer, Dept. of History	(1) Women's Realities, Women's Choices pp. 397-433. (2) Du Bois, W.E.B. The Education of Black People. ed. H. Aptheker pp. 83-102 and 139-158. (3) Young, A. (1976) "The Educational Philosophy of Booker T. Washington" Phylon 37, pp. 224-235. (4) Bell-Scott, P. "Black Women's Higher Education" Sage 1, 8-11 (1984).
3/5/85	E.E. Just	Faculty-Presentation and Faculty-led Discussion	Manning, K.R. Black Apollo of Science Chapts. 1-3 (pp. 3-114).
3/7/85	" "	Student-led Discussion	Manning, Chapts. 4-5 (pp. 115-207).
3/12/85	Guest Lecture and Discussion: Dr. K. Manning, MIT.		
3/14/85	E.E. Just	Student-led Discussion	Manning, Chapts. 6-7 (pp. 208-300).
3/19/85	E.E. Just	" " "	Manning, Chapts. 8-9 (pp. 302-330).

DATE	TOPIC	FORMAT	ASSIGNED READING
3/21/85	[Discussion with Dr. Walter Massey, Physics, University of Chicago (?)]		
	SPRING	BREAK	YAY!!!!!!!!
4/2/85	Women Scientists in America to 1940	Faculty overview and Faculty-led Discussion	Rossiter, Chapts. 1-3 pp. 1-72
4/4/85	" "	Student-led Discussion	" " 4-5 pp. 73-128
4/9/85	" "	" "	" " 6-7 pp. 129-217
4/11/85	" "	" "	" " 8-9 pp. 218-266
4/11/85	" "	" "	" " 1h-11 pp. 267-31h
4/16/85	Current Trends	Faculty Overview and Faculty-led Discussion	(1) Malcolm, Shirley "Racism and Sexism: Still a Double Bind for Minority Women in Science" (2) Caress, Barbara "Medical School Sweepstakes" Health/PAC Bulletin (1977) 76 pp. 2-7. (3) Malcolm, Shirley "Women in Science and Engineering: An Overview". (4) Berryman, Sue (1983) "Who Will Do Science?" pp. 3-13.
4/23/85	Women and Minorities in Science: Why Does It Matter?	Faculty Introduction/ Student-led Discussion	(1) Green, Rayna "Culturally-Based Science: The Potential for Traditional People, Science and Folklore". (2) Malcolm, Shirley "Women in Science, Why?". (3) Needham, J. "History and Human Values: A Chinese Perspective for World Science and Technology" (1980) in Ideology of/in the Natural Sciences ed. Rose and Rose pp. 231-258.

DATE	TOPIC	FORMAT	ASSIGNED READING
4/23/85 (continued)			(4) Horton, Robin "African Traditional Thought and Western Science" in Rationality ed. Bryan R. Wilson (1970). (5) Guthrie, R.V. "Psychometric Scientism" in Even the Rat was White (1976) pp. 47-73.
4/25/85	Women & Minorities in Science? Why Does It Matter?	Student-led Discussion	(1) Keller, E.F. Selection from Reflections on Gender and Science (1985) To Be Announced. (2) Fausto-Sterling, A. "Women and Science" Women's Studies Int. Quarterly 4 (1981) 41-50. (3) Merchant, C. (1981). "Earthcare" Environment 23, 6-15. (4) Haraway, Donna "Class, Race, Sex, Scientific Knowledge" in Women in Scientific and Engineering Professions eds. V.B. Haas and C.C. Perrucci (1984) pp. 212-229. (5) Schweickart, P. "What if ... Science and Technology in Feminist Utopias" in Machina Ex Dea ed. J. Rothschild (1983) pp. 198-211.
4/30/85	STUDENT PRESENTATIONS		
5/2/85	STUDENT PRESENTATIONS		
5/7/85	STUDENT PRESENTATIONS		

BIBLIOGRAPHIES

Aldrich, Michele L. "Women in Science" Signs 4: 126-135 (1978)

Aldrich, Michele L. Bibliography on Women in Geology for Women's History Week. History of Science Society Women's Committee.(1983)

Andersen, Margaret L. Suggested Readings on Sociology and Race, January (1984)

Arditti, Rita "Feminism and Science: A Selected Biography. Cambridge, MA

Brush, Stephen G. Teacher's Guide: History of Modern Science (1983) (University of Maryland at College Park)

Chambers, Frederick Bibliography entitled Black Higher Education in the United States Call # Z5814 B44 C45 REF

Chinn, Phyllis Zweig "Women in Science and Mathematics Bibliography" (1979) distributed by the American Association for the Advancement of Science

Daugen, J. History of Mathematics: A Selective Bibliography, Garland (1985) Has a section on women and on cross-cultural work.

Fowlkes, Diane L. Selected Bibliography, Women's Studies (United States focus), for Africana Women's Studies Institute, Atlanta University, August (1983)

Green, Rayna Native American Women: A Bibliography. Ohoyo Resource Center Staff, Owanah Anderson, Director, Ed. (1981) Call #: Z1209.2 N67 G75 1983 REF

Guy-Sheftall, Beverly Selected Readings and Resources in Black Women's Studies Women's Research and Resource Center, Spelman College, Atlanta, GA

Hall, Paula Quick, Tehin, Mary Jane, and Warner, Rachel Bibliography on Women in Science, Engineering and Mathematics reprinted from Michele L. Aldrich and Paula Quick Hall, Programs in Science, Mathematics and Engineering for Women in the United States: 1966-1978, Washington, DC: American Association for the Advancement of Science, 1980, pp. 225-273.

Harding, Sandra Feminism and Science: Starter Bibliographies

Ireland, Norma (Olin) Index to Scientists of the World, from Ancient to Modern Times: Biographies and Portraits.
Boston: F.W. Foxon Co. (1962)
Z 7404 17 (Reference)

Martin, Jane Roland Report Submitted to the Creative and Critical Thinking in Science Project, U. Mass Boston, August 31, 1984

Mandelbaum, Dorothy Rosenthal "Women in Medicine" Signs 4: 136-145 (1978)

Owens, Dolores B. and Marguerite M. Hanckey Abstracts and Indexes in Science and Technology: A Descriptive Guide
Metuchen, NJ: Scarecrow Press (1974)
Z 7403 095 (Sciences)

Sims, Janet The Progress of Afro-American Women: A Selected Bibliography and Resource Guide. Greenwood Press (1980)

Wolff, Kathryn AAAS Science Book List Supplement
Compiled and edited by Kathryn Wolff and Joll Deborah Storey
Washington, DC American Association for the Advancement of Science (1978)
AAAS Publication 78-5
Z 7401 W58 (Reference)

BOOKS

BLACK STUDIES: Background Reading

Bennett Jr., Lerone The Shaping of Black America. Chicago: Johnson Publishing Co. (1975)

Bennett Jr., Lerone Before the Mayflower: A history of the Negro in America. Baltimore: Penguin (1966)

Carlson, Sherri (Ed.) International Journal of Women's Studies Vol. 4, September/October (1981) Vermont: Eden Press Women's Publications

Drachman, Virginia G. Hospital with a Heart: Women Doctors and the Paradox of Separatism at the New England Hospital, 1862-1969. Ithaca and London: Cornell University Press (1984)

Dubois, W.E.B. Black Reconstruction in America

Dubois, W.E.B. Souls of Blackfolk

DuBois, W.E.B. The Education of Black People. The Univ. of Massachusetts Press, Amherst, MA (1973) LC2801 D79

Ebony: Ebony Pictorial History of Black America. The White Problem in America. Chicago: Johnson Publishing Co.

Franklin, Vincent The Education of Black Philadelphia: The Social and Educational History of a Minority Community 1900-1950. University of Penn. Press (1979)

Sterling, Dorothy Tear Down the Walls: A History of the American Civil Rights Movement. Garden City NY: Doubleday and Co. (1968)

Washington, Booker T. Up From Slavery

WOMEN'S STUDIES: Background Reading

Bates, Ulku U., F.L. Denmark, V. Held, D.O. Helly, S.H. Lees, S.B. Pomeroy, E.D. Smith, and S.R. Zalk. Women's Realities, Women's Choices. New York, Oxford: Oxford University Press (1983)

Black Women's Education Premier Issue of SAGE Vol 1:1 (1984)

Conable, Charlotte Williams The Myth of Equal Education Ithaca and London: Cornell University Press (1977)

Flexner, Eleanor A Century of Struggle

Friedman, J. and W. Shade Our American Sisters: Women in American Life and Thought

Newman, Louise Michele (Ed.) Men's Ideas/Women's Realities. Pergamon Press (1985)

Sinclair, Andrew The Emancipation of the American Woman

Sterling, Dorothy (Ed.) We Are Your Sisters: Black Women in the Nineteenth Century. New York and London: W.W. Norton and Co. (1984)

SCIENCE AS A SOCIAL PROCESS: Background Reading

Bronowski, Jacob The Common Sense of Science

Cannon, Susan Faye Science in Culture: The Early Victorian Period. New York: Science History Publications (1978)

Dickson, David The New Politics of Science. New York: Pantheon Books (1984)

Dinnerstein, Dorothy The Mermaid and the Minotaur

Goodfield, June An Imagined World: A Story of Scientific Discovery. New York: Penguin Books (1982)

Kuhn, Thomas Samuel The Structure of Scientific Revolutions. Chicago: University of Chicago Press (1962)

Kuhn, Thomas Samuel The Essential Tension: Selected Studies in Scientific Tradition. Chicago: University of Chicago Press (1977)

Lambert, Karel and Gordon G. Brittan, Jr. An Introduction to the Philosophy of Science. Englewood Cliffs, NJ: Prentice-Hall, Inc. (1970)

Merton, Robert Sociology of Science

Oppenheimer, Robert J. The Open Mind, New York: Simon and Schuster (1955) QC780 06

Shapley, Harlow Beyond the Observatory. New York: Scribner (1967)

Wechsler, Judith On Aesthetics in Science. Cambridge, MA: MIT Press (1978)

WOMEN AND MINORITIES IN SCIENCE

Aptheker, Bettina Women's Legacy: Essays on Race, Sex, and Class in American History. Amherst: University of Massachusetts Press (1982)

Arnold, Lois Barber Four Lives in Science. New York: Schochen Books (1984)

Babbitt, M.K. (1912) Maria Mitchell as HerStudents Knew Her

Baldwin, Richard S. The Fungus Fighters: Two Women Scientists and Their Discovery.

Barriers to Equality in Academia: Women in Computer Science at MIT Prepared by Female Graduate Students and Research Staff in the Laboratory for Computer Science and the Artificial Intelligence Laboratory at MIT, February (1983)

Bedini, Silvio A. The Life of Benjamin Banneker Charles Scribner's Sons, NY (1972) QB36 B22 B4

Berryman, Sue E. Who Will Do Science? Trends, and their causes, in minority and female representation among holders of advanced degrees in science and mathematics. A Special Report, The Rockefeller Foundation (1983)

Boland, Bill and B.H. Radin (Eds.) Successful Women in the Sciences: An Analysis of Determinants. New York: NY Acad. of Sci. (1973)

Bucciarelli, L.L. and N. Dworsky Sophia Germain: An Essay in the History of the Theory of Elasticity. A.D. Reidel (1980)

Burt, McKinley, Jr. Black Inventors of America National Book Company, Portland, OR (1969)

Carwell, Hattie Blacks in Science: Astrophysicist to Zoologist Exposition Press, NY (1977)

Climbing the Ladder. An Update on the Status of Doctoral Women Scientists and Engineers. National Academy Press, Washington, DC (1983) Q130 C54.
Available from: National Technical Information Services
5285 Port Royal Road
Springfield, VA 22161
#PB83-181321 TBG

Diggs, Irene Black Innovators Institute of Positive Education, Chicago, IL (1975)

Ehrenreich, Barbara and English, Deirdre Witches, Midwives, and Nurse. A History of Women Healers, The Feminst Press, SUNY/College at Old Westbury, NY (1973)

Fins, Alice Women in Science

Future Technology and Woman Proceedings of the Conference March 6-8 1981 San Diego State University. San Diego: CH2M Hill (1981)

Goodfield, June An Imagined World: A Story of Scientific Discovery. New York: Penguin Books (1982)

Gornick, Vivian Women in Science. New York: Simon and Schuster (1983)

Guthrie, Robert V. Even the Rat Was White New York: Harper & Row, Publishers (1976)

Haas, Violet B. and Carolyn C. Perrucci (Eds.) Women in Scientific and Engineering Professions. Ann Arbor: The University of Michigan Press (1981)

Haber, Louis Black Pioneers of Science and Invention. Harcourt, Brace & World, Inc., New York (1970)

Haber, Louis Women Pioneers of Science. Harcourt Brace Jovanovich, Orlando, FL (1979)

Hayden, Robert C. Eight Black American Inventors. Addison-Wesley, Reading, MA (1972)

Hayden, Robert C. Seven Black American Scientists Addison-Wesley, Reading MA (1970)

Jay, James M. Negroes in Science: Natural Science Doctorates, 1876-1969. Balamp Publishing, Detroit, MI (1971)

Kammer, Ann E., Cherlyn S. Granrose, and Jan B. Sloan Science, Sex, and Society. Women's Educational Equity Act Program, U.S. Office of Health, Education, and Welfare, Office of Education (1979)

Keller, Evelyn Fox A Feeling for the Organism. San Francisco: W.H. Freeman and Co. (1983)

Kendall, P.M. Maria Mitchell: Life, Letters and Journals (Orig Pub. 1896)

Kennedy, Don H. Little Sparrow: A Portrait of Sophia Kovalevsky. Ohio Universiy Press (1983)

Klein, Aaron E. The Hidden Contributors. Black Scientists and Inventors in America Doubleday & Company, Inc., New York (1971)

Koblitz, Ann Hibner A Convergence of Lives: Sofia Kovalevskaia, Scientist, Writer, Revolutionary. Boston: Birkauser (1984)

Kramer, Edna E. The Nature and Growth of Modern Mathematics, Princeton University Press, New Jersey (1981) [pages 698-717 deal specifically with the contributions of women to mathematics]

Levin, B.S. Women and Medicine 1980 Metuchen, NJ

Malcolm, Shirley, Paula Quick Hall and Janet Welsh Brown "The Double Bind: The Price of Being a Minority Woman in Science". Washington, DC, American Association for the Advancement of Science. AAAS Report No. 76-R-3, April (1976)

Manning, Kenneth R. Black Apollo of Science: The Life of Ernest Everett Just. New York and Oxford: Oxford University Press (1983)

McMurry, Linda O. George Washington Carver: Scientist & Symbol New York: Oxford University Press (1981)

Miller, H. and E. Mason Contemporary Minority Leaders in Nursing. American Nurses Asso., Inc. (1983)

Newell, Virginia K. Black Mathematicians and Their Works. Ardmore, PA: Dorrance and Co. (1984)

Osen, Lynn M. Women in Mathematics. The Massachusetts Institute of Technology (1974)

Oyfell, O.S. Lady Laureates (1978) Metuchen, NJ

Payne-Gaposchkin: An autobiography and other recollections Katherine Haramundanis (Ed.) Cambridge University Press, NY (1984)

Posner, Alice Women in Engineering

Ramaley, Judith (Ed.) Covert Discrimination and Women in the Sciences

Rossiter, Margaret W. Women Scientists in America. Baltimore and London: The Johns Hopkins University Press (1982)

Rothschild, Joan (ed.) Machina Ex Dea: Feminist Perspectives on Technology. Pergamon Press, (1983)

Rowe, Anne Making of a Woman Scientist

Ruddick, Sara and Pamela Daniels Working it Out: 23 Women Writers, Artists, Scientists and Scholars Talk About Their Lives and Work New York (1982)

Saunders, Doris E. (Ed.) The Negro Handbook. Chicago: Johnson Publishing Co. (1974)

Smith, Diane Women in Finance

Synnott, Marcia Graham The Half-Opened Door: Discrimination and Admissions at Harvard, Yale, and Princeton, 1900-1970. Connecticut: Greenwood Press (1979)

The Negro in Science, The Calloway Hall editorial committee: Julius H. Taylor, ed. and others. Baltimore: Morgan State College Press (1965) Q183 U6 M26 Contains an overview of work done in the 20th century by black scientists

as well as reprints of selected scientific publications in the fields of biology, chemistry, mathematics and physics. An appendix contains short career biographies of more than 100 black men and women scientists.

Sterling, Dorothy *The Making of an Afro-American: Martin Robison Delaney, 1812-1885*. Doubleday (1971) [Delaney was also a physician].

Ullman, Victor *Martin R. Delaney, the beginnings of Black nationalism* Beacon Press (1971) [Delaney was also a physician].

Van Sertima, Ivan *Blacks in Science: Ancient and Modern* Transaction Books, (1983)

Women and Minorities in Science and Engineering. National Science Foundation, January (1984)

OTHER MINORITIES

Gorelick, Sherry *City College and the Jewish Poor: Education in New York, 1880-1924* New York: Schocken Books (1982)

Oh, T.K. *The Asian Brain Drain*

Puerto Ricans in Science and Biomedicine: Report of a Conference Office of Opportunities in Science, American Association for the Advancement of Science, Washington, DC, November (1981)

Takaki, Ron *Iron Cages: Race and Culture in the 19th Century America*

ARTICLES

Aptheker, Herbert The Negro Scientist and Inventor. Masses and Mainstream 4:2 80-89 (1951)

Arnold, Lois Barber "A historical perspective" Geology 5: 493-504 (1977)

Baker, Henry E. "The Negro in the Field of Invention" Journal of Negro History 2: 21-36 (1917)

Beardsley, E.H. "Making Separate Equal: Black Physicians and the Problems of Medical Segregation in the Pre-world War II South" American Association for the History of Medicine, Toronto Canada, May (1981)

Boyer, M. Jacques "Sketch of Maria Agnesi" Popular Science Monthly 53: 403-409, July, (1898)

Brown, Russell W., and James H.m. Henderson "The Mass Production and Distribution of HeLa Cells at Tuskegee Institute, 1953-55" Journal of the History of Medicine 38: 415-431 (1983)

Bruer, John T. "Women in Science: Lack of Full Participation" Science 221:1339 (1983)

Bruer, John T. "Women in Science: Toward Equitable Participation" Science, Technology, & Human Values 9: 3-7 (1984)

Brush, S.G. "Nettie M. Stevens and the Discovery of Sex Determination By Chromosomes." ISIS 69: 163-172 (1978)

Burrage, Hilary F. "Women University Teachers of Natural Science, 1971-71". Social Studies of Science 13 (1983)

Caress, Barbara "Medical School Sweepstakes: The Race is Fixed" Health/Pac Bulletin 76: 1-7 (1977) [Despite small gains made in the late 1960s and early 1970s, minority students are increasingly underrepresented in US medical schools]

Caress, Barbara with Judy Kossy "The Myth of reverse Discrimination: Declining Minority Enrollment in New York City's Medical Schools" A Health/PAC Special Report by the Health Policy Advisory Center, Ind. (1977)

Cash, Philip "Pride, Prejudice, and Politics" Harvard Medical School Alumni Assoc. Bulletin 54: December (1980)

Chinn, Phyllis Zweig and Marcia Angell "Women in Medicine: Beyond Prejudice". New England Journal of Medicine 304:19 (1981)

Cohen I. Bernard "Florence Nightingale" Scientific American March, PP. 128-138 (1984)

Cole, Jonathan R. "Women in Science". American Scientist 69 (1981)

Coolidge, Julian L. "Six Female Mathematicians" Scripta Mathematica 18(1-2): 20-31 (1951)

Crowley, Anne E. and Hayden C. Nicholson, MD "Negro Enrollment in Medical Schools" Journal of the American Medical Association 210: 96-100 (1969)

"Discovery of Pulsars: A Graduate Student's Storyz" Science 189: 358-360 (1975)

Downing, Lewis K. "Contributions of Negro Scientists" The Crisis 46(#6): 167-169 (1939)

Dubreil-Jacotin, Mme. Marie-Louise "Women Mathematicians" in Great Currents of Mathematical Thought (F. LeLionnais, Ed.) Vol. I pp 269-280 (1971)

Elder, Eleanor S. "Women in Early Geology" Journal of Geological Education 30: 287-293 (1982)

"Employment of Colored Women in Chicago" From a study made by the Chicago School of Civics and Philanthropy. The Crisis 1: 24-25 (1911)

Farnes, Patricia "Intellectual History of Women in Medical Science".

Feldman, Jacqueline "The savant and the midwife" Impact of Science on Society 25#2: 125-136 (1975)

Garfield, Eugene "A Tribute to Miriam Rothschild: Entomologist Extraordinaire" Current Contents April, pp. 3-15 (1984)

Green, Rayna "Culturally-Based Science". International Journal of Women's Studies: Women and Science Vol. 4 #4 Sept/Oct (1981) [Deals with Native Americans in Science]

Hall, Paula Quick "Problems and Solutions in the Education, Employment and Personal Choices of Minority Women in Science" Office of Opportunities in Science, American Association for the Advancement of Science, August (1981)

Hall, Paula Quick and Shirley M. Malcom "Minority Women in Science: A Statistical View" National Network of Minority Women in Science, Office of Opportunities in Science, American Association for the Advancement of Science

Harlan, Louis R. "Booker T. Washington and the White Man's Burden" American Historical Review 71: 441-467 (1965-66)

Hines, Jeffrey "Blacks and the Physician Glut" Syncytium, Brown University, Providence, RI, Summer 1984

Houlihan, Sherida and John H. Wotiz "Women in Chemistry Before 1900" Journal of Chemical Education 52: 362-364 (1975)

Janik, Linda Gardiner "Searching for the metaphysics of science: the structure and composition of madame Du Chatelet's 'Institutions de physique, 1737-1740'" The Voltaire Foundation, Studies on Voltaire and the Eighteenth Century

Johnson, Leonard "History of the Education of Negro Physicians" Journal of Medical Education 42: 439-446 (1967)

Jones, Allen W. "The Role of Tuskegee Institute in the Education of Black Farmers" Journal of Negro History 60: 252-267 (1975)

Kass, Amalie M. "Dr. Thomas Hodgkin, Dr. Martin Delany, and the 'Return to Africa'" Medical History 27: 373-393 (1983)

Keenan, Katherine "Lilian Vaughan Morgan (1870-1952): Her Life and Work" Amer. Zool. 23: 867-876 (1983)

Keller, Evelyn Fox "Women in Science: An Analysis of a Social Problem". Harvard Magazine, pp. 14-19

Kenschaft, Patricia C. "Black Women in Mathematics in the United States" Journal of African Civilizations pp 63-83, April (1982)

Kidwell, Peggy Aldrich "Women astronomers in Britain, 1780-1930" ISIS, 75: 534-546 1984)

Kramer, Edna E. "Six More Female Mathematicians" Scripta Methematica 23(1-4): 83-95 (1957)

Malcom, Shirley M. "Women in Science and Engineering: An Overview" Prepared for: National Academy of Sciences Commission on Behavioral and Social Sciences and Education September (1983)

Malcom, Shirley Mahaley "Racism and Sexism: Still a Double Bind for Minority Women in Science" Prepared for: "A Fabric of Our Own Making": Southern Scholars on Women, March (1981)

Marrett, Cora Bagley "On the Evolution of Women's Medical Societies" Bulletin of the History of Medicine 53: 434-448 (1979)

McMaster, Philip D. and Michael Heidelberger "Florence Rena Sabin, November 9, 1871 - October 3, 1953" Biographical Memoirs XXXIV, pp. 271-319

Merchant, Carolyn "Women and the Environmental Movement" Environment 23: 8-40 (1981)

"Minorities and Mathematics" A Ford Foundation Staff Paper # 415 July (1982)

Monteiro, Lois A. "On Separate Roads: Florence Nightingale and Elizabeth Blackwell SIGNS 9: 520-533 (1984)

Morantz, Regina Markell "Feminism, Professionalism, and Germs: The Thought of Mary Putnam Jacobi and Elizabeth Blackwell American Quarterly 34: 459-478 (1982)

Morantz, Regina Markell and Sue Zschoche "Professionalism, Feminism, and Gender Roles: A Comparative Study of Nineteenth-Century Medical Therapeutics" The Jounral of American History 67: 568-588 (1980)

"Negro in Higher Education in 1921-22" The Crisis 24: 108-110 (1922)

Ogilvie, M.B. and C.J. Choquette "Nettie Maria Stevens (1861-1912): Her Life and Contributions to Cytogenetics" Proc. Amer. Philos. Soc. 125, 292-311 (1981)

Pearson, Jr., Willie Blacks in Science: Why Aren't There More? Annual Meeting of the Mid-South Sociological Association, Monroe, Louisiana, November 3-5, 1977

Rossiter, Margaret W. A review of "George Washington Carver: Scientist and Symbol" by Linda O. McMurry, Oxford Univ. Press (1981). Isis 75: 427-428 (1984).

Smith, Elske V.P. "Covert Discrimination and Women in the Sciences" AAAS Selected Symposium

"Some Chicagoans of Note" The Crisis 10: 127-242 (1915)

Vetter, Betty M. "Working women scientists and engineers" Science 207: 28-35 (1980)

Vetter, Betty M. "Women scientists and engineers: trends in participation" Science 214: 1313-1321 (1981)

Warner, Deborah Jean "Women Astronomers" Natural History, 88(5): 13-26, May 1979

Wharton, Clifton R., Jr. "The Minority Student Challenge" Science 224: #4652, June 1, 1984

White, Martha S. "Psychological and social barriers to women in science" Science (1970)

Wilson, Joan Hoff "Dancing Dogs of the Colonial Period: Women Scientists" Early American Literature 7 (1973) pp. 225-235

Wilson, Marjorie P. "The status of women in medicine: Background data" JAMWA 36(2): 62-79 (1981)

"Women of Mathematics" The Arithmetic Teacher 17(4): 316-324 (1970)

Young, Alfred "The Educational Philosophy of Booker T. Washington, A Perspective for Black Liberation" Phylon 37: 224-235 (1976)

Zaslavsky, Claudia "Neglected Subject of the Black Experience" Freedomways, Second Quarter 1980, pp. 112-113.

Ziem, Grace "Medical Education Since Flexner: A Seventy Year Tracking Record" Health/Pac Bulletin 76: 8 (1977) [Although there are many more women and a few more minority students, the backgrounds of today's medical school enrollees are hardly distinguishable from that of their predecessors of a half century ago.]

VISUAL AIDS

Brink, Linda H. and Geri Denterlein (Producers) Women in Medicine. The Joint Committee on the Status of Women, Harvard Medical School

Spacewomen, production of "NOVA", WGBH, Boston (Time-Life Video) (1984)

Episodes from "Smithsonian World" WETA, Box 2626, Washington, DC 20013

Vetter, Betty M. Opportunities in Science and Engineering. Scientific Manpower Commission, Washington, DC, September (1980)

JOURNALS

Acta Sociologica

American Astronomical Society Bulletin
QB1.A1897 (Sciences)

American Math Monthly
QA1.A422 (Sciences)

American Psychologist
BF1.A6 (Sciences)

American Sociologist
HM1.A7 2-Size

Arithmetic Teacher
QA135.A2.A6 (Sciences)

Black Scholar
E185.5.B57

Ebony
AP=EB7

Journal of African Civilizations

Journal of Applied Psychology
HM251.A1.J5 (Sciences)

Journal of Black Psychology
E185.625.J68 (Sciences)

Journal of Chemical Education
QD1-J87 (Sciences)

Journal of College Science Teaching
Q181-A1J7

Journal of Counseling Psychology
BF636.A1.J6 (Sciences)

Journal of Cross-Cultural Psychology
GN270.J65

Journal of Education
L11.J55

Journal of Educational Research
L11.J64

Journal of Human Resources
HD 570 1.J6

Journal of Medical Education
R745.J6 (Sciences)

Journal of Negro History 1917-1979

Journal of Research in Science Teaching
Q181.A1.J73

Journal of Social Issues
HN51.J6

SAGE - Scholarly Journal on Black Women
P.O. Box 42741
Atlanta, GA 30311

Science
Q1.S35 (Sciences)

Science Education
Q1.G3

Science Teacher
Q1.S53 (Sciences)

Scientific American
T1-S5

Sex Roles
HQ768.S4 (Sciences)

Signs
HQ1101.S5

Social Forces
HN51.S67

Social Problems
HN51.S68

Women and Health

REFERENCE WORKS

American Statistics Index
Z 7554

Bibliographic Index
Z1002 B594

Biography Index
Z5301

Congressional Information Service
JK 1001

Current Biographies
CT 120-09

Dictionary of American Biography
E176 D56

Dictionary of American Negro Biography
E185.96 L6

Dissertation Abstracts International
Series A Humanities/Social Service
Series B Sciences (Sciences Library)

International Bibliography of the Social Sciences
Z5111

Library of American Civilization
Z1236-L5

Notable American Women
E176-N65 1

Notable American Women: The Modern Period
E176 D56

P.A.I.S.
Z7163-P9

Periodical Articles by and about Blacks
Z1361 N39 I62

Who's Who of American Women 1983-84
E176 W58

Who's Who Among Black Americans 1980-81
E185.96 W5

Women's Studies Index Abstracts
Z 7962